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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of J. YANOF, et al.	)	Examiner: B. ROY
Serial No.: 09/990,518	)	Art Unit: 3737
Filed: November 21, 2001	)	Confirmation: 3075
For: **METHOD OF REVIEWING TOMOGRAPHIC SCANS WITH A LARGE NUMBER OF IMAGES**	)	
Notice of Appeal Filed: May 15, 2007	)	
Attorney Docket No.: PKRZ 2 00718 /PHUS017057US	)	Cleveland, OH 44114 June 19, 2007

<u>COMBINED APPEAL BRIEF AND NOTICE OF APPEAL</u>

Commissioner For Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This is an Appeal from the Final Rejection of May 15, 2007, rejecting claims 1-18 and 20.

The 37 CFR 41.20(b)(1) Appeal Fee in the amount of <u>$ 500.00</u> was previously paid on April 3, 2006.

The 37 CFR 41.20(b)(2) Appeal Brief Fee in the amount of <u>$ 500.00</u> was previously paid on May 30, 2006.

<u>CERTIFICATE OF ELECTRONIC TRANSMISSION</u>

I certify that this Combined Appeal Brief and Notice of Appeal and accompanying documents in connection with U.S. Serial No. 09/990,518 are being filed on the date indicated below by electronic transmission with the United States Patent and Trademark Office via the electronic filing system (EFS-Web).

June 25, 2007
Date

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(i) REAL PARTY IN INTEREST

The Real Party in Interest is the Assignee, KONINKLIJKE PHILIPS ELECTRONICS, N.V.

(ii) RELATED APPEALS AND INTERFERENCES

There are no related Appeals or Interferences.

(iii) STATUS OF CLAIMS

Claims 1-18 and 20 are pending in the application.

Claims 1-5 and 20 stand rejected under 35 U.S.C. § 103 as being unpatentable over Horiuchi (US 6,137,858) in view of Lonn (US 5,271,576), further in view of Wood (US 6,925,200; US 2002/0070970). It should be noted that by virtue of filing dates, Wood is only a reference against the present application to the extent that the subject matter relied upon is also disclosed in one of its parent application 09/946,209 of which it is a continuation-in-part or of one of its parent provisional applications 60/314,582 and 60/252,743.

Claims 6-18 stand rejected under 35 U.S.C. § 103 as being unpatentable over Horiuchi in view of Wood.

Claim 19 has been cancelled.

(iv) STATUS OF AMENDMENTS

No amendments were filed subsequent to the Final Rejection of May 15, 2007.

Amendment C of February 3, 2006 filed after the Final Rejection of November 3, 2005 has not been entered. Amendment C and Request for Reconsideration of April 3, 2006 has been entered.

The claims as set forth in Amendment D accurately reflect the claims on appeal.

(v) SUMMARY OF CLAIMED SUBJECT MATTER

The present application is directed to a new and improved method and apparatus for reviewing tomographic scans with a large number of images [0006].

To this end, **claim 1** calls for a diagnostic medical imaging system **100** which has an examination region **112** in which a subject is positioned [0022]. The imaging apparatus obtains a plurality of first image slices having a first thickness [0023]. See also [0002] and [0028] in which the slices, also referenced as thin axial cross-sectioned slices, having a thickness of 0.5 mm, are discussed. The first image slices are stored in an image memory or other storage device that is a part of workstation **150** [0028]. For a whole-body scan at the discussed 0.5 mm slices, about 3500-4000 image slices are generated and stored for radiologist review, for a modest 20 cm (8 inch) scan range, about 400 first image slices are generated [0002]. This vast number of slices to be reviewed by the diagnosing radiologist leads to the drawbacks referenced in [0004] and [0005].

To overcome these problems, a data processor in the workstation **150** combines subsets of n contiguous first slice images to create second or thick slice image [0029]. In this manner, a set of second, thicker image slices is generated by combining subsets of the first, thinner image slices [0029]. A display **152** includes a plurality of view ports including a first view port (Figure 2) which depicts one or more of the second, thick image slices and a second view port (Figure 3) which depicts one or more of the first, thin slice images, which depicted first, thin image slice(s) is a constituent of the depicted, second thick image slice(s) depicted in the first view port [0030]. This has the advantage of allowing the radiologist to review $1/n^{th}$ as many second, thick image slices when high resolution is not needed, reducing the time burden on the radiologist. But, the radiologist can conduct a review of one or more of the constituent higher resolution, first, thin image slices in the second viewport when a more in-depth examination is desired [0039].

With reference to **claim 6**, a diagnostic medical imaging system includes an acquisition means **100** for acquiring a plurality of first, thin image slices [0027, 0035]. A combining means in the workstation **150** generates a plurality of second, thick image slices from combined subsets of the first, thin image slices. The subsets include a plural number n of contiguous first, thin image slices. The second,

thick image slices correspond to a second thickness which is n times the first thickness. The first, thin and second, thick image slices are parallel to each other [0029, 0030]. A first display means or port (Figure 2) depicts a selected one of the plurality of second, thick image slices and a second display means or port (Figure 3) displays one or more of the first, thin image slices included in the subset that was combined to make the second, thick slice image displayed in the first display means (Figure 2) [0030, 0037].

With reference to **claim 10**, the diagnostic medical imaging system includes a small object detection and highlighting (SODH) feature. The SODH feature further projects outlines **305b**, **310b** of the detected small objects **305a**, **310a** from the constituent first, thin image slices into their corresponding second, thick image slice to prevent such small objects **305a**, **310a**, from becoming obscured, lost, or imperceivable when the thin slices are combined to create the second, thick image slice [0040 -0042].

With respect to **claim 11**, the outlines **305b**, **310b** of the small objects are color-coded [0041].

With respect to **claim 14**, a means (GUI) is provided for designating regions for close review. During the sequential progression **200b** through the second, thick image slices, when the designated region is reached, a reviewer is directed to the first, thin image slices for review [0036-0037].

With reference to **claim 15**, the present application discloses a medical diagnostic imaging method. A plurality of first 2D images of a subject are attained, which first images represent a plurality of contiguous first, thin slices [0035, 0029]. A plurality of second, thick 2D images are generated from subsets of the first, thin images by merging together the first, thin images in each of the subsets. The subsets include the first, thin images for a number of contiguous slices. The second images represent slices of a second thickness which is greater than the first thickness [0035, 0029]. Regions of the subject are designated by a reviewer for closer review [0035, 0038]. The second, thick images are sequentially displayed [0039] for review by the reviewer [0037]. When the designated regions are reached, the first, thin images are displayed for review by the reviewer [0036, 0037, 0039].

Claim 18 calls for detecting small objects **305a**, **310a** within the subsets of first objects [0040] and projecting outlines **305b**, **310b** of the detected small objects **305a**, **310a**, into the second, thick images corresponding to the respective subsets [0041].

(vi) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1-5 are rendered obvious in the sense of 35 U.S.C. § 103 over Horiuchi as modified by Lonn, and as further modified by Wood.

Whether independent claim 6 and dependent claims 7-14 are rendered obvious in the sense of 35 U.S.C. § 103 over Horiuchi in view of Wood.

Whether claim10 is rendered obvious in the sense of 35 U.S.C. § 103 over Horiuchi in view of Wood.

Whether claim11 is rendered obvious in the sense of 35 U.S.C. § 103 over Horiuchi in view of Wood.

Whether claim 12 is rendered obvious in the sense of 35 U.S.C. § 103 over Horiuchi as modified by Wood.

Whether claim 14 is rendered obvious in the sense of 35 U.S.C. § 103 over Horiuchi as modified by Wood.

Whether claim 15 and claims 16-18 and 20 dependent therefrom are rendered obvious in the sense of 35 U.S.C. § 103 over Horiuchi in view of Wood.

Whether claim 18 is rendered obvious in the sense of 35 U.S.C. § 103 over Horiuchi in view of Wood.

Whether claim 20 is rendered obvious in the sense of 35 U.S.C. § 103 over Horiuchi as modified by Lonn, as further modified by Wood.

(vii) ARGUMENT

It is common in the medical diagnostic imaging arts to generate a plurality of axial sections or slices, such as with a CT scanner and display these images on a display or monitor having a plurality of view ports. The present application refers the reader to prior patents US 5,371,778 and US 5,734,384 which are incorporated herein by reference, by way of example.

Modern CT scanners are able to scan thin image slices. The present application, filed in 2001, references 0.5 mm slices. More recently in the news, the Kennewick man was imaged using a CT scanner with 0.39 mm slices. While generating data with such thin slices is advantageous in that it provides high resolution (in the axial direction) image data, there is a downside. A modest 20 cm (8 inch) scan range at 0.5 mm generates 400 slice images. A whole body scan of a 1.8 m (6 foot) person generates about 3600 slice images [0002]. On the downside, this vast number of images can be overwhelming or unduly burdensome [0003]. The present invention contemplates a new and improved method and/or apparatus for reviewing tomographic scans with a large number of images which overcome these problems and others [0006].

Horiuchi discloses a CT scanning system suitable for scanning the lungs of a patient. The system has an x-ray beam **40** which is collimated **22** to a preselected thickness (th). This beam is detected by two detectors **240**, **242** to collect data concurrently for two adjacent slices. The slice are un-symmetrically divided (column 5, line 60), e.g., such as a 3 mm slice and a 7 mm slice (column 7, lines 30-35). During scanning, the patient table is translated in 10 mm steps (column 6, lines 63-65). Thus, Horiuchi generates data for alternating 3 mm and 7 mm slices which is stored in a 7 mm memory **108**, and a 3 mm memory **108′** (Figure 6). The unreconstructed projection data from the 3 mm and 7 mm slices is also combined **112** to generate 10 mm projection data. Then, in three independent image reconstruction **114**, **114′**, **114″**, the 3 mm data is reconstructed into a 3 mm image data set and stored at **116′**, the 7 mm data set is stored in an image memory **116** and the 10 mm image data is reconstructed and stored in a memory **116″**.

Note that the data is only combined **112** when it still projection data. The images are not combined. Indeed, the 7 mm slices are reconstructed using a

different reconstruction function than the 3 mm slices. As set forth in Horiuchi at column 7, lines 36-45, the 7 mm and 10 mm data sets are reconstructed using a low frequency band-enhancing reconstruction function. By contrast, the 3 mm projection data is reconstructed using a high frequency band-enhancing reconstruction function. The low frequency band-enhancing reconstruction provides good definition in the parenchymal portions of the internal tissue; whereas, the high frequency band-enhancing reconstruction provides good definition in details of the internal tissue.

At column 7, lines 59-67, Horiuchi calls for using this data by examining the full set of 10 mm slices of the lung, and by observing the set of 3 mm slices which, of course, have 7 mm gaps between each other. Thus, if Horiuchi images a 40 cm axial section, Horiuchi will generate 40 10 mm slices for review and 40 3 mm slices for review. Horiuchi is unable to examine the regions between the 3 mm slices in the 3 mm detail.

Wood proposes a different solution to the problem of examining a large number of slices. For example, in an imaging session, Wood may generate 200 or more axial sections or slices [0041]. Sections as used by Wood and slices as used herein are synonymous. Wood displays different slices in different viewports **510**, **520**. However, all slices are of the same thickness. To address the excessively large number of images, Wood uses an automatic nodule locating algorithm [0072]. Cancerous nodules, or at least candidate cancerous nodules found by the automatic operation, are identified by circles **541**, **542** in the first view port **510** [0049]. The circles can also be displayed in the second view port **520** as illustrated in Figure 13. However, view port **520** does not display a slice image, but rather displays a volumetric image illustrating the entire lungs to give the operator a perspective for where in the lungs the detailed slice image displayed in port **510** is located. When the operator designates one of the nodules, it is brought up in a third view port **530**. Using a trackball and mouse, the region of interest in the third view port **530** is rotated [0076, 0086]. The nodules or region of interest is displayed in the third view port **530** and is described as having a volume and a diameter [0079] which suggests that the display in the third view port is a volume display. That view port **530** displays a volume is confirmed by [0043], which states that **530** is a magnified and rotatable portion of the volume rendered in view port **520**. Thus, in the embodiment of Wood

upon which the Examiner relies, Wood illustrates one axial slice in a first port **510**, a volumetric navigation image in a second view port **520**, and a rotatable volumetric image of an identified region of interest in a third view port **530** [0043].

Lonn discloses a detector **114** that, in the embodiment of Figure 6, has nine sensors in the axial direction. As shown in Figure 7, the outputs of these nine sensors are combined **56** into a single output signal **32** which is processed and reconstructed **36** into a single slice image **37**. By adjusting a weighting factor **55**, one can adjust the axial width of the single selected slice. For example, the output of detectors **41-44** and **46-49** can be zeroed and detector **45** can be given a weighting of one. In this manner, a slice with a thickness determined by the size of the focal spot **13** of the x-ray beam and the size of the single active detector **45** can be generated (Figure 10b). Output data from the other eight detectors is not used in this embodiment.

In the embodiment of Figure 9, there are 15 detectors. A multiplexer can be used to combine the outputs of detectors $\mathbf{60_1}$-$\mathbf{60_5}$ to generate one slice, $\mathbf{60_6}$-$\mathbf{60_{10}}$ to generate a second slice, and $\mathbf{60_{11}}$-$\mathbf{60_{15}}$ to generate a third slice (column 7, lines 41-53). Different numbers or widths of slices can be generated by combining different numbers of the detectors prior to reconstruction. There is no suggestion of combining the resultant images.

Claim 1 calls for the data processor to combine n contiguous first image slices to generate each of the plurality of second image slices corresponding to a second thickness which is n times the thickness of the first image slices.

Horiuchi combines detector outputs prior to reconstructing the data into images. Further, for each 10 mm slice, Horiuchi generates one first image slice (3 mm) and one thicker slice image (7 or 10 mm). Thus, unlike claim 1, which generates n+1 images for each second thickness (1 second image slice and n first image slices), Horiuchi only generates one image of each thickness for a total of three images per thickness (th).

Moreover, Horiuchi combines pre-reconstruction image data and does not combine images. As set forth at column 7, lines 36-45, the images with different thicknesses were reconstructed using different reconstruction functions and have different characteristics and would not be amenable to being added.

Lonn does not cure this shortcoming of Horiuchi. Where Horiuchi uses two detectors **240**, **242**, Lonn uses nine detectors **41-49** or 15 detectors $\mathbf{60_1}$-$\mathbf{60_{15}}$. Like Horiuchi, Lonn does not combine images. Rather, Horiuchi combines the outputs of detectors prior to reconstruction.

Lonn is not addressing the problem of how a radiologist can synthesize a large number of slices. Rather, Lonn is concerned with providing a CT scanner which can generate image slices of a selectable width from very thin (1 mm) to very thick (10 mm) (column 1, lines 64-66). Lonn selects the thickness of the desired slices prior to conducting the scan, which scan results in images of the selected slice thickness. Once the images are reconstructed, Lonn provides no enabling disclosure or suggestion how to change the slice thickness of the resultant images or that it would be desirable to do so.

Further, claim 1 calls for the n first (thin) image slices to be contiguous. In Horiuchi, the 3 mm slices are not contiguous. They are spaced by 7 mm.

Further, claim 1 calls for a plurality of view ports including a first view port in which the second (thick) image slice is displayed and a second view port in which one or more of the n first slices which were combined to make the displayed second (thick) image slice is displayed. Wood shows that displays with multiple view ports are known, but makes no suggestion of displaying images with different slice thicknesses. Lonn discloses displaying an image of whatever thickness was selected, but makes no suggestion of displaying both a combined image and one of the images which was combined to make it. Horiuchi displays slices with different slice thicknesses. But, none of the displayed slices were generated by combining any of the other displayed images with like images.

Because the 3 mm and 7 mm images of Horiuchi are reconstructed using different frequency band-enhancing reconstructions, it is submitted that combining the 3 mm and 7 mm reconstructed images of Horiuchi would not result in Horiuchi's 10 mm image.

Accordingly, it is submitted that **claim 1 and claims 2-5 dependent therefrom** distinguish patentably over the references of record.

Claim 6 calls for n of the first slices images to be combined into each second slice image. Horiuchi does not combine images. Rather, Horiuchi combines data and reconstructs individual images with different properties.

Because the images reconstructed by Horiuchi have different properties, it is submitted that there is no motivation to combine them. Moreover, even if one were to combine the 3 mm and the 7 mm images of Horiuchi, one would not achieve a 10 mm image with the same properties as the 10 mm image of Horiuchi because the 3 mm and 7 mm images are reconstructed using different frequency band enhancing reconstruction functions.

Claim 6 further calls for the thickness of the second or thicker images to be n times the thickness of the first (thin) image slices. None of the 3 mm, 7 mm and 10 mm images of Horiuchi are multiples of one another.

Claim 6 further calls for displaying one of the second image slices and one or more of the first image slices which was combined to generate it. Horiuchi does not display a thicker image slice and one or more of n image slices which were combined to generate it.

Wood does not address combining images, combining n thinner images to generate a thicker image, or a thicker image having n times the thickness of one of the images which was combined to generate it.

Accordingly, it is submitted that **claim 6 and claims 7-14 dependent therefrom** distinguish patentably over the references of record.

Claim 10 calls for a means for detecting small objects in the subsets of the first image slices, which small objects have dimensions in the direction of the slice thickness less than the second slice thickness of the second slice images, and a means for projecting outlines of the detected small objects onto the second image slices. In this manner, claim 10 calls for bringing objects to light which are smaller than the thickness of the second slice images. Horiuchi is devoid of any suggestion of locating such small objects or outlining them. Wood, which makes no suggestion of identifying objects in thin slice images and projecting outlines of such small objects into thicker images which are thicker than the small object, fails to cure this shortcoming of Horiuchi.

Claim 11 depends from claim 10 and further calls for color-coding the detected small objects to differentiate them from each other. As set forth above, such identifying of small objects and projecting outlines is not suggested by Horiuchi or Wood. Similarly, color-coding such small objects is not suggested by either of the references relied upon by the Examiner.

Claim 13 calls for a means for sequentially progressing through the second (thick) image slices such that each in turn is displayed on the first display means for review. **Claim 14** adds a means for designating regions for close review. During the sequential progression through the second slice images, a reviewer is directed to the first image slices for review when the designated region for closer review is reached. Neither Wood nor Horiuchi teach or fairly suggest designating regions for closer review and during the course of sequential examination of thicker slice images directing the reviewer to thinner slice images.

Accordingly, it is submitted that **claims 10, 11, and 13-14** further distinguish patentably over the references of record.

Claim 15 calls for obtaining a plurality of first images of a first thickness. Claim 15 further calls for these first images to represent contiguous slices. Although Horiuchi generates a plurality of 3 mm images and a plurality of 7 mm images, the 3 mm images are not contiguous to each other, but are separated by 7 mm and cannot qualify as the claimed first images. Similarly, because the 7 mm images of Horiuchi are not continguous, but are separated by 3 mm, they too cannot qualify as the first images. Although the 3 mm and 7 mm images of Horiuchi are not contiguous to each other, Horiuchi's 3 mm and 7 mm images are not of the first thickness, but are of different thicknesses.

Claim 15 next calls for generating a plurality of second images by merging together first images from each of a plurality of subsets. The subsets include a number of first images for a number of contiguous slices. The second images represent slices of a second thickness which is greater than the first thickness. Horiuchi does not suggest combining 3 mm images with each other, nor does Horiuchi suggest combining 7 mm images with each other.

Claim 15 further calls for designating regions of the subject for closer review by a reviewer. Horiuchi does not suggest such a designation. Claim 15

further calls for displaying the second images sequentially for review by a reviewer and, when the designated regions are reached, displaying the first images for review by the reviewer. Horiuchi makes no suggestion of designating regions of the subject for closer review, much less displaying the second images which are combinations of a plurality of first images and then displaying the first images for review when the designated regions are reached.

Wood does not address the combining of images nor display sequences for displaying combined and non-combined images. Rather, Wood suggest using an automatic defect locating routine and then jumping directly to the defects. Thus, it is submitted that Wood does not cure or even address the above-noted shortcomings of Horiuchi.

Accordingly, it is submitted that **claim 15 and claims 16-18 and 20 dependent therefrom** distinguish patentably and unobviously over the references of record.

Claim 18 further calls for detecting small objects contained in the first images and projecting outlines of the detected small objects into corresponding second images. Neither Horiuchi nor Wood make any suggestion of detecting such small objects in the thin images and projecting such outlines into thick images. Accordingly, it is submitted that claim 18 distinguishes yet more forcefully over the references of record.

CONCLUSION

For the reasons set forth above, it is submitted that claims 1-18 and 20 distinguish patentably and unobviously over the references of record. An early reversal of the Examiner's rejection of these claims is requested.

Respectfully submitted,

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(viii) CLAIMS APPENDIX

1. A diagnostic medical imaging system comprising:

an imaging apparatus having an examination region in which a subject being examined is positioned, said imaging apparatus obtaining a plurality of first image slices of the subject, said first image slices having a first thickness;

a storage device into which the first image slices are loaded;

a data processor which combines subsets of first image slices to generate a plurality of second image slices having a second thickness greater than the first thickness, said subsets each including a number n of contiguous first image slices, where n is an integer, said second image slices corresponding to a second thickness which is n times the first thickness, the first and second slices being parallel to each other; and,

a display having a plurality of view ports including a first view port which depicts one or more selected second image slices and a second view port which depicts one or more first image slices which are constituents of one of the second image slices depicted in the first view port.

2. The diagnostic medical imaging system according to claim 1, wherein the data processor combines the subsets using a uniform averaging projection.

3. The diagnostic medical imaging system according to claim 1, wherein the display includes a third view port which depicts a reference image which is viewed from a direction transverse to the first and second image slices.

4. The diagnostic medical imaging system according to claim 3, wherein the third view port superimposes over the reference image depicted therein graphical representations of the relative locations of the first and second images slices shown in the first and second view ports, respectively.

5. The diagnostic medical imaging system according to claim 1, further comprising:

a storage device into which the second image slices are loaded.

6. A diagnostic medical imaging system for examining a subject, said diagnostic medical imaging system comprising:

acquisition means for obtaining a plurality of first image slices of the subject, said first image slices corresponding to a first thickness;

combining means for generating a plurality of second image slices from combined subsets of first image slices, said subsets including a plural number n of contiguous first image slices, said second image slices corresponding to a second thickness which is n times the first thickness, the first and second slices being parallel to each other;

first display means for displaying selected ones of the plurality of second image slices; and,

second display means for displaying one or more of the first image slices included in the subset used to generate one the second image slices being displayed by the first displaying means

7. The diagnostic medical imaging system of claim 6, further comprising:

third display means for displaying a reference image which includes superimposed therein graphical representations of the relative locations of the second and first image slices displayed by the first and second display means, respectively.

8. The diagnostic medical imaging system of claim 7, further comprising:

means for updating the display of the first, second and third display means in response to a selection of a point in one of the same, such that each of the first, second and third display means displays the selected point.

9. The diagnostic medial imaging system of claim 7, wherein the reference image is selected from a view consisting of a coronal view, a sagittal view, and a multi-planar reformatted view.

10. The diagnostic medical imaging system of claim 6, further comprising:

means for detecting small objects contained in the subsets of first image slices, said small objects having dimensions in the direction of slice thickness less than the second thickness; and,

means for projecting outlines of detected small objects onto the second image slices corresponding to the respective subsets.

11. The diagnostic medical imaging system of claim 10, wherein the outlines of detected small objects are color coded to distinguish them from one another.

12. The diagnostic medical imaging system of claim 6, further comprising:

means for storing the first and second image slices.

13. The diagnostic medical imaging system of claim 6, further comprising:

means for sequentially progressing through the plurality of second image slices such that each in turn is displayed on the first display means for review.

14. The diagnostic medical imaging system of claim 13, further comprising:

means for designating regions for close review such that during the sequential progression, when a designated region is reached, a reviewer is directed to the first image slices for review.

15. A method of diagnostic medical imaging, said method comprising:

(a) obtaining a plurality of first 2D images of a subject, said first images representing a plurality of contiguous slices of a first thickness;

(b) generating a plurality of second 2D images from subsets of the first images by merging together the first images in each subset, said subsets including first images for a number of the contiguous slices they represent, said second images representing slices of a second thickness which is greater than the first thickness;

(c) designating regions of the subject for close review by a reviewer;

(d) sequentially displaying the second images for review by the reviewer; and,

(e) displaying the first images for review by the reviewer when the designated regions are reached.

16. The method according to claim 15, wherein step (b) includes:

combining the subsets of the first images via uniform averaging projection.

17. The method according to claim 15, further comprising

displaying a reference image of the subject; and,

superimposing in the reference image graphical representations of the relative locations of displayed first and second images.

18. The method according to claim 15, further comprising:

detecting small objects contained within the subsets of the first images; and,

projecting outlines of the detected small objects into the second images corresponding to the respective subsets.

19. (Cancelled)

20. The method according to claim 15, wherein n first images are combined to generate each second image and the second thickness is n times greater than the first thickness, where n is an integer.

(ix) EVIDENCE APPENDIX

None

(x) RELATED PROCEEDINGS APPENDIX

None